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MARINE DEPOSITS.

Les Dépôts marins. By Dr. Léon W. Collet. Pp. vii+325; with 35 figures in text and a map. (Paris: Octave Dion, 1908.) Price 5 francs.

THE publication of this volume is connected with the inauguration of a scientific work on the grandest scale. It is proposed to issue under the title of "Encyclopédie scientifique" about 1000 volumes in the French language, dealing with every branch of pure and applied science. The general director of this vast work is Dr. Toulouse, and its general secretary M. H. Pieron; but for each of the branches of science, to the number of forty, an editor specially conversant with the subject has been secured.

The volume before us is the first published of the group of works on "Océanographie physique," the editor of which is Dr. Jules Richard, of the Musée Océanographique de Monaco. Dr. Collet, who is a privat-docent in the University of Geneva, had the advantage of spending two years of study in the *Challenger* Office in Edinburgh, and the volume is appropriately dedicated to Sir John Murray. The work is professedly based on Murray and Renard's well-known *Challenger* volume, though a considerable amount of information obtained by later researches is incorporated by the author. The illustrations are taken either from the *Challenger* Report, from Dr. J. M. Flint's Bulletin on the Oceanography of the Pacific, from the Encyclopædia Britannica, or from the papers published by the author and Dr. Lee on glauconite deposits.

The book commences with a slight sketch of the work done in the subject before the despatch of the *Challenger* Expedition, and an essay on the effects of temperature in determining the distribution of plants and animals at the surface and in the deeper parts of the ocean. The classification adopted for the various deposits is that of Sir John Murray, with some slight and unimportant modifications, though the author notices the attempt of Thoulet to substitute for this grouping one on a mathematical basis—the size and chemical composition of the particles of which the deposits are built up being taken as a guide.

While the accounts of the several oozes and of the manganese nodules and other materials found in the red muds are condensed from the descriptions in the *Challenger* volume, the chapter on the glauconite deposits extends to much greater length (48 pages), and is taken, with its illustrations, from the paper published by the author and Dr. Lee in the Proceedings of the Royal Society of Edinburgh.

The fourth division of the book, dealing with the deposits of coral-origin, extends to considerable length, and includes references to recent works, such as the Funafuti Report of the Royal Society, and the results of Mr. Stanley Gardiner's work in the Indian Ocean. The author adopts the estimate of the last-mentioned naturalist as to the limit of depth of coral-reef building organisms—namely, 64 metres for corals and 120

metres for "nullipores." In discussing theoretical conclusions from the known facts concerning coral-reefs, however, the author seems to be labouring under some unfortunate misconceptions. He says:—

"Le sondage de l'atoll de Funafuti dans les îles de l'Ellice fut entrepris aux fins d'obtenir des renseignements sur le soubassement d'une île corallienne; bien que ce but n'ait pas été atteint, ce sondage n'en est pas moins très important, comme nous le verrons dans la suite" (pp. 261, 262).

It cannot, however, be sufficiently understood and remembered that the Coral-Reef Committee of the Royal Society was formed, not to seek for confirmation of any particular theory, but to obtain facts which might enable us to put the several theories to a critical test, and in this it was entirely successful. The committee included the advocates of all the different theories, and the plan and details of the expedition were agreed upon by mutual arrangement. The selection of Funafuti—as the most typical of atolls—was made by the late Admiral Sir W. Wharton (who was not a believer in Darwin's theory), and was accepted by every member of the committee. It was agreed by all that a boring of 1000 feet would be sufficient to test the several theories, even on the most liberal estimate of the depth at which reef-forming corals, &c., could flourish. The actual depth reached was 1114 feet, and the very careful study of the materials brought up was shown by Dr. Hinde to demonstrate, beyond doubt, that—setting aside subsequent chemical changes—the rock, from top to bottom, consists of the same organisms, in the same conditions as respects position of growth and association. Neither in the microscopical characters of the rock nor in its chemical composition was there the smallest indication in the lowest cores brought up of any volcanic, or, indeed, of any non-calcareous rock being approached. It was open, of course, to the opponents of Darwin's views to oppose the undertaking of the boring as an adequate test. But it is scarcely fair, now that the test has been applied under their own auspices, to declare that it is of no value.

The author reproduces an attempted explanation, with modifications by later authors, of the facts ascertained at Funafuti. But it must be remembered that these are new views, put forward since the boring was brought to such a successful termination by the skill and energy of Profs. Sollas and David and their assistants. Neither the theory of a talus nor the amended suggestion of the building up of the lower part of the atoll by the growth *in situ* of deep-sea corals, nullipores, or other organisms, receives the smallest support from the study of the cores brought up. Every unprejudiced observer of the whole course this discussion has taken must be convinced that the Funafuti boring, far from having failed in its object, was carried to a successful and useful conclusion.

In the final division of the work the author discusses some of the geological formations in the light of the results obtained by deep-sea explorations. In these he generally follows and summarises the work of M. Cayeux. In his discussion of the origin of the oolites,

he makes no reference to the interesting recent researches of Mr. Wethered, nor to the early observations of De la Beche. The account of rocks formed by siliceous organisms is equally defective in many respects, and the papers of Dr. Hinde are not referred to either in the text or in the "Index Bibliographique" at the end of the volume.

Taken as a whole, therefore, the work, while it may be regarded as a very useful summary of the general results obtained, up to the present time, in the study of the ocean-floor by deep soundings, cannot be commended as an absolutely safe guide to those anxious to make their acquaintance with all the original sources of information on the subject.

THE CONTRAST BETWEEN GERMAN AND ENGLISH EDUCATION.¹

German Education, Past and Present. By Prof. Friedrich Paulsen. English translation by Dr. T. Lorenz. Pp. xx+310. (London: T. Fisher Unwin, 1908.) Price 5s. net.

TO write well a short book on a vast subject is a task which only a master can accomplish. It is not too much to say that Prof. Paulsen is the only man in Europe who could have given, within such small compass, so readable and well-proportioned an account of the growth of German education from a remote past to the present time. Dr. Paulsen has style as well as profound knowledge. He knows what to leave out. He neither fatigues the reader by a superfluity of uninterpreted facts nor offends him by superficiality of treatment. Two years ago Messrs. Teubner, of Leipzig, published the original edition of this work in a slim, closely printed volume of less than 200 pages as one of the series which they are issuing under the title "Aus Natur und Geisteswelt." Now Mr. Unwin gives us the book pithily and idiomatically translated by Dr. Lorenz, and prefaced by a useful outline of the mechanics of the German educational system, and a short dictionary of English renderings of German technical terms. As it stands, it is the handiest book on the outlines of the subject in the English language.

For an English reader the weakest point in the book lies in the fact that Dr. Paulsen knows comparatively little about the history of education in England. This is not his fault. The history of English education—that most elusive, intricate, and many-provined subject—has not yet been satisfactorily written. Piece by piece, the materials for it are being brought together by scholars like Mr. Arthur Leach, Dr. Rashdall, Prof. Foster Watson, Mr. J. E. G. de Montmorency, and Mr. Sidney Webb. But the facts are not yet known with anything like completeness as regards some critical periods in the history of our English schools. The time for synthesis and illuminating generalisation has not come. We ourselves suffer from this at every turn. Pamphleteers give us what they believe to be the meaning of our educational history, and often mis-

lead us as completely as might a guide with a bad map. But, apart from Mr. Graham Balfour's invaluable summary of facts in his "Educational Systems of Great Britain and Ireland," there is at present no book about higher education in the United Kingdom to which a student can turn as he turns to Dr. Paulsen's "Geschichte des gelehrten Unterrichts auf den deutschen Schulen und Universitäten," to the translation of which, by the way, Dr. Lorenz may perhaps feel willing to turn his hand. The result of this gap on the student's bookshelf is that even Dr. Paulsen, in spite of the extraordinary range of his knowledge of educational developments, fails to see the significance of the sidelights which German educational history throws upon English, and which, in its turn, English educational history throws upon German.

To the practical Englishman the main question which arises in the perusal of a book like this is "What have we to learn from the history of German education? What pitfalls can the record of their experiments help us to avoid?" Now, broadly speaking, the English and German systems of education are at the present time moving in precisely opposite directions towards a point which lies somewhere in the wide space which now stretches between them. In other words, the study of German education (using that term in a broad sense) is for an Englishman a study in contrasts. Germany (again using that term with due regard to the fact that one part is as different from another as Scotland is from England) has a great respect for intellect; we are a little on our guard against it. Germany believes in scientific research as applied to industry and commerce. We are only beginning not to be contemptuous of it. Germany is fast extending the age of compulsory education through the critical years of (at any rate male) adolescence. In England and Wales, out of the half-million children who annually leave the public elementary schools at thirteen or fourteen years of age, not more than one in three ever afterwards receives in point of civic or technical education any further systematic care.

So far the score is against us. But there is another side of the account. For real independence of private judgment the atmosphere of English life is much more favourable than the German. In the healthy development of the character of girls, the German schools have much to learn from the best English, and German secondary education can offer, except in schools which have broken loose from official routine, nothing really comparable to the training of the will which is afforded by the corporate life, where it is healthy and inspiring, of a first-rate English school.

The English reader of Dr. Paulsen's sketch, which, because it is drawn by a master-hand, shows the capital features of the situation in bolder outline than might a more detailed picture, cannot but note two points of significant difference in the educational history of the two countries. For generations education has been more thought of as a necessary State function in Germany than with us. But there was a time

¹ This review was written before the lamented death of Prof. Paulsen on August 15.